

## Multi-Configuration Matched Spectral Filter Core, Phase II

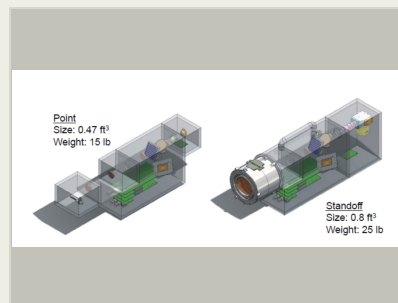
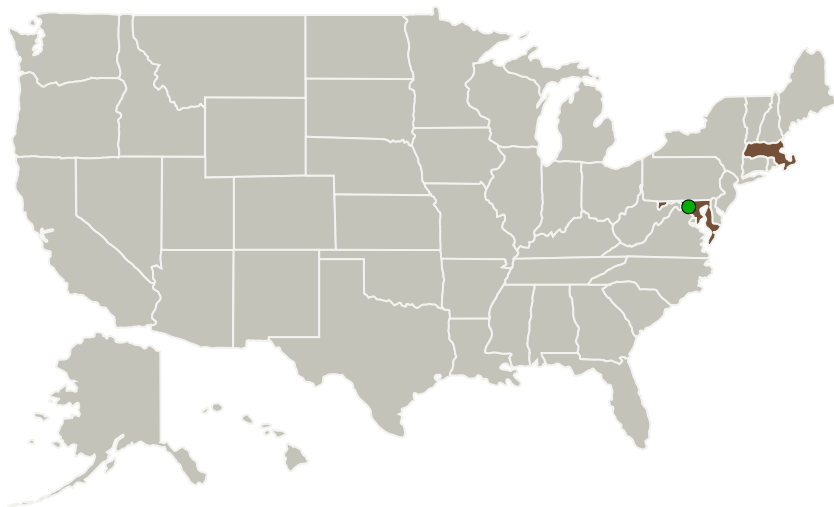
Completed Technology Project (2014 - 2016)



## Project Introduction

OPTRA proposes the development of a modular, reconfigurable matched spectral filter (RMSF) spectrometer for the monitoring of greenhouse and volcanic gases. The heart of this spectrometer will be an RMSF core, which can be paired with different fore-optics or detector modules to achieve active point or passive standoff detection of the chemicals of interest. The RMSF core is comprised of a dispersive spectrometer that images the sample spectrum from 3 – 5.5 micron onto a digital micro-mirror device (DMD) such that different columns correspond to different wavebands. By applying masks to this DMD, a matched spectral filter can be applied in hardware. This results in a highly flexible system that can address a wide variety of chemicals by simply updating the DMD masks applied and a wide variety of applications through modular hardware design. Use of the DMD and a single element detector in place of a conventional FPA results in significantly reduced cost and improved performance in terms of image uniformity, pixel operability, and dynamic range. The proposed Phase II effort will produce a prototype RMSF core with one set of fore-optic and detector modules for each of the two detection modalities.

## Primary U.S. Work Locations and Key Partners



Multi-Configuration Matched Spectral Filter Core, Phase II

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Organizations Performing Work	Role	Type	Location
Optra, Inc.	Lead Organization	Industry	Topsfield, Massachusetts
● Goddard Space Flight Center(GSFC)	Supporting Organization	NASA Center	Greenbelt, Maryland

Primary U.S. Work Locations	
Maryland	Massachusetts

## Project Transitions

▶ **April 2014:** Project Start

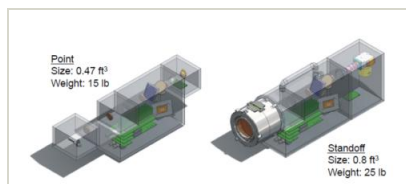
✓ **April 2016:** Closed out

**Closeout Summary:** Multi-Configuration Matched Spectral Filter Core, Phase II Project Image

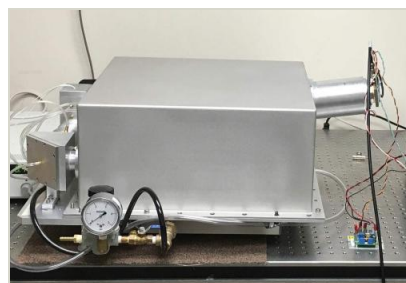
**Closeout Documentation:**

- Final Summary Chart Image(<https://techport.nasa.gov/file/137427>)

## Images

**Briefing Chart Image**

Multi-Configuration Matched Spectral Filter Core, Phase II  
(<https://techport.nasa.gov/image/128982>)

**Final Summary Chart Image**

Multi-Configuration Matched Spectral Filter Core, Phase II Project Image  
(<https://techport.nasa.gov/image/137059>)

## Organizational Responsibility

**Responsible Mission Directorate:**

Space Technology Mission Directorate (STMD)

**Lead Organization:**

Optra, Inc.

**Responsible Program:**

Small Business Innovation Research/Small Business Tech Transfer

## Project Management

**Program Director:**

Jason L Kessler

**Program Manager:**

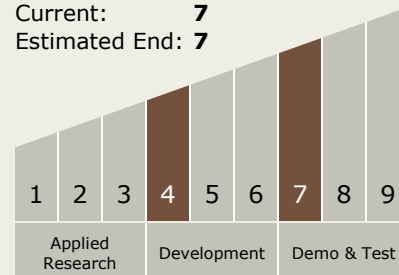
Carlos Torrez

**Principal Investigator:**

James Engel

## Technology Maturity (TRL)

Start: 4  
Current: 7  
Estimated End: 7



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### Technology Areas

#### Primary:

- TX08 Sensors and Instruments
  - └ TX08.1 Remote Sensing Instruments/Sensors
    - └ TX08.1.1 Detectors and Focal Planes

### Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System